

REMARKS

Applicants respectfully request reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow. Claims 1, 13, 16, 45, and 53 have been amended. No new matter has been added. Support for these claim amendments can be found at least in Figures 2 and 3 and paragraphs [0049], [0052], [0059], and [0062] of the published specification. Claims 1, 4, 8, 9, 11-16, 20, 21, 23, 33, 34, and 43-59 remain pending in this application.

I. Examiner Interview

Applicants thank the Examiner for the courtesy extended during the interview on April 16, 2010 with Applicants' representative Nicholas Lagerwall. During the interview, the various claim amendments and arguments detailed below were discussed. No agreement was reached on the patentability of the claims.

II. Allowable Subject Matter

On page 32 of the Office Action, Claims 43 and 44 were objected to as being dependent upon a rejected base Claim 1, but would be allowable if rewritten in independent form. As described below, Applicants believe that, as amended, independent Claim 1 is in condition for allowance and, accordingly, Claims 43 and 44 have not been amended.

III. Claim Rejections Under 35 U.S.C. § 102

Claims 45, 46, 48, and 51 were rejected under 35 U.S.C. § 102(b) as being anticipated over U.S. Patent No. 5,706,111 ("Morales"). Independent Claim 45 has been amended. Applicants respectfully submit that Morales fails to disclose each and every element of amended Claim 45.

Amended independent Claim 45 recites, in part, that (with emphasis added):

each optically pumped source is configured to receive the data modulated pumping light from its respective optical network unit at a first wavelength different from other wavelengths of the data modulated pumping light received at the other optically pumped sources;

...

a wavelength division multiplexer (WDM) configured to receive the data modulated transmission light from the plurality of optically pumped sources and route the data modulated transmission light to the hub

(emphasis added). Applicants respectfully submit that Morales fails to disclose such elements.

On pages 2-3 of the Office Action, the Examiner appeared to analogize each OAB to a “plurality of optically pumped sources” and further asserted that the OABs multiplex the various signals processed at the OABs, thus serving also as a wavelength division multiplexer. However, Applicants respectfully submit, as detailed below, that signals received at each OAB of Morales have the same wavelength. As such, Morales fails to disclose “each optically pumped source is configured to receive the data modulated pumping light from its respective optical network unit at a first wavelength different from other wavelengths of the data modulated pumping light received at the other optically pumped sources,” as recited in Claim 45 (emphasis added).

Column 4, lines 27-30 of Morales discloses “an access node AN that concentrates and/or multiplexes the optical signals of the optical network terminating (ONT) units in order to access the optical switching centre CE.” On page 7 of the Office Action, the Examiner analogized the optical access boards (OABs) of Morales to the “optically pumped sources” of Claims 1, 16, and 19.

Column 5, lines 1-9 of Morales states (with emphasis added):

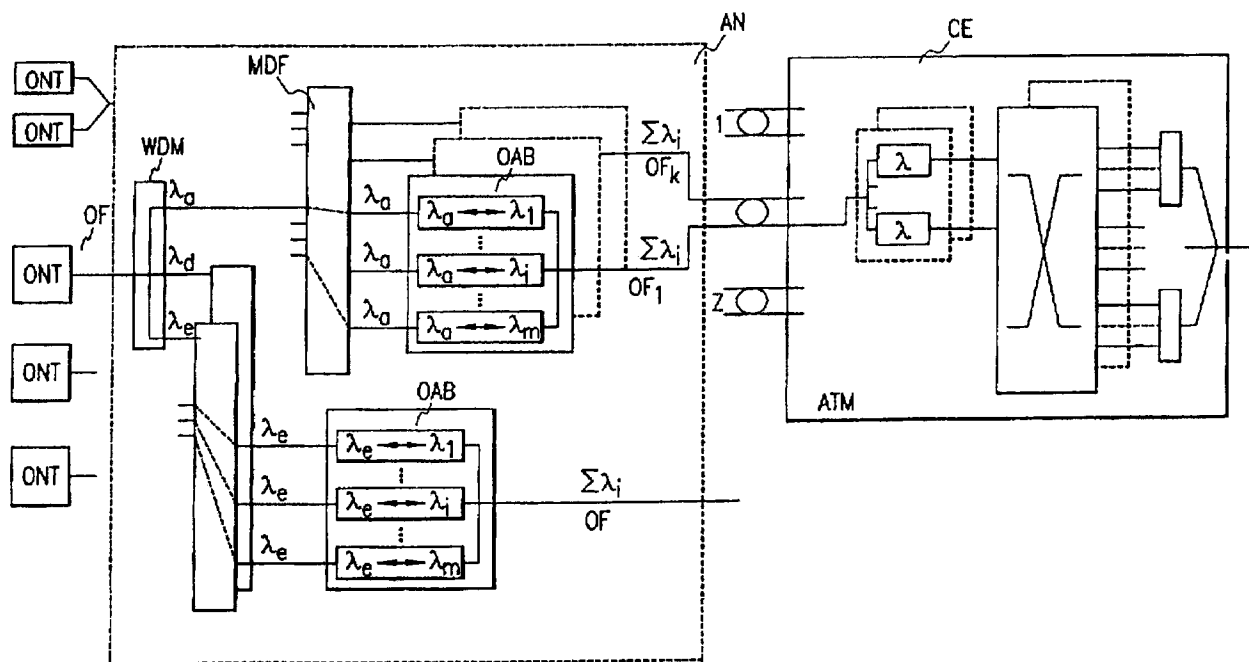
The access node AN also has a wavelength demultiplexer-multiplexer WDM for each subscriber, which demultiplexes the different wavelengths λ_a , λ_d , λ_e of each service originating in the

subscriber premises and directs each of these to the corresponding plane of service in the access node AN; in the opposite direction, it multiplexes the different wavelengths λ_a , λ_d , λ_e coming from the corresponding planes of service in the access node AN and sends them to the subscriber premises.

Column 5, lines 14-24 of Morales states (with emphasis added):

Finally, at the access node AN there is a set of k optical access boards OAB for each plane of service, which performs the following functions: ... they first perform the conversion of the **fixed wavelength** coming from each subscriber optical network terminating unit into another wavelength λ_i , that is different for each active unit, into a set of m different wavelengths, and second, the multiplexing of the m different wavelengths over one of the optical fibers that connect to the center.

Fig. 2 of Morales is illustrated below for convenience:



As such, Morales discloses that multiple signals having a same, fixed wavelength are received at each respective optical access board (OAB). The fixed wavelengths of each signal are then converted to different wavelengths such that each signal passed through the OAB has a

different wavelength. These signals (which have different wavelengths only after processing by the OAB) are then multiplexed and transmitted to the switching center. However, Morales fails to disclose that signals having different wavelengths are initially received at each respective OAB.

Note that the wavelengths of the signals received at a first OAB of Morales may be different than the wavelengths of signals received at the other OABs based on the particular plane of service for each OAB. However, Morales discloses only that the signals processed through a same OAB are multiplexed together. Morales fails to disclose a multiplexer that multiplexes signals processed through different OABs and then routes the multiplexed signals to the switching center. Independent Claim 45 recites “a wavelength division multiplexer (WDM) configured to receive the data modulated transmission light from the plurality of optically pumped sources (which was received via different wavelengths) and route the data modulated transmission light to the hub” (emphasis added). Morales fails to disclose such elements.

For at least the reasons discussed above, Applicants respectfully submit that Morales fails to disclose each and every element of independent Claim 45 (and its associated dependent claims). Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejection of Claims 45, 46, 48, and 51 under 35 U.S.C. § 102(b).

IV. Claim Rejections Under 35 U.S.C. § 103

On pages 8-32 of the Office Action, Claims 1, 4, 8-13, 15, 16, 20, 21, 23, 33, 34, 47, 49, 50, and 52-59 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Morales in view of various other references. More specifically:

- Claims 1, 4, 8-10, 13, 15-16, 21, 23, 33, and 53-54 were rejected over Morales, in view of “A Low-Cost WDM Source with ASE Injected Fabry-Perot Semiconductor Laser,” IEEE Photonics Technology Letters, Vol. 12, No. 8, August 2000, pages 1067-1069, by Kim, et al. (“Kim”), and “Semiconductor Optical Amplifier-Based All-Optical Gates for High-Speed Optical Processing,”

IEEE Journal on Selected Topics in Quantum Electronics, Vol. 6, No. 6, November/December 2000, pages 1428-1435, by Stubkjaer (“Stubkjaer”);

- Claims 11, 12, 20, and 34 were rejected over Morales in view of Kim, Stubkjaer, and U.S. Patent No. 6,434,175 (“Zah”);
- Claim 47 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Morales, in view of “High temperature, optically pumped, 1.55 mm VCSEL operating at 6 Gb/s,” 57th Annual Device Research Conference Digest, 28-30 June 1999, pp. 196-197, by Keating et al. (“Keating”);
- Claims 49-50 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Morales, in view of U.S. Patent No. 6,434,175 over Zah (“Zah”);
- Claim 52 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Morales, in view of Kim; and
- Claims 53 and 55-59 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Morales, in view of Keating.

Independent Claims 1, 16, 45, and 53 have been amended. Applicants respectfully submit that Morales, Kim, Stubkjaer, Zah, and Keating, alone or in combination, fail to disclose, teach, or suggest each and every element of amended independent Claims 1, 16, 45, and 53.

A. The applied references fail to disclose “a plurality of optical network units each corresponding to only one of the plurality of optically pumped sources.”

i. Morales fails to disclose such an element.

Amended independent Claim 1 recites, in part, “a plurality of optical network units each corresponding to only one of the plurality of optically pumped sources” (emphasis added). Independent Claim 16, although different in scope, recites similar features. Applicants respectfully submit that Morales, Kim, Stubkjaer, Zah, and Keating, alone or in combination, fail to disclose, teach, or suggest such an element.

On page 9 of the Office Action, the Examiner analogized the “optical network units” of Claim 1 to the “optical network terminals (ONTs)” of Morales and the “optically pumped sources” of Morales to an “optical access board (OAB)” of Morales. However, as discussed above, Morales discloses a “wavelength division multiplexer (WDM)” that demultiplexes

“different wavelengths of each service” received from each ONT (see Fig. 2; column 5, lines 1-9). Morales further discloses that “main distribution frames (MDF)” then allocate the different wavelengths associated with the different services to different OABs (see Fig. 2; column 5, lines 10-24). As such, each ONT of Morales sends signals to multiple OABs in the access node AN and, as such, each ONT corresponds to multiple OABs. In contrast, Claim 1 recites “a plurality of optical network units each corresponding to only one of the plurality of optically pumped sources” (emphasis added).

- ii. The combination of Morales with the other references fails to disclose such an element.

Applicants respectfully submit that Kim, Stubkjaer, Zah, and Keating, alone or in any proper combination with Morales, fail to cure the deficiencies of Morales.

On page 10 of the Office Action, the Examiner appeared to rely on Kim merely to disclose “a plurality of injection-locked sources configured to receive injection light from an injection source outside the passive kerb location.” Kim teaches a Fabry-Perot semiconductor laser diode that receives amplified spontaneous emission (ASE) from an ASE source and a pseudorandom bit sequence from a pattern generator. (See Abstract and Fig. 1). Kim discloses only a single pattern generator that feeds a single that feeds a single laser diode. Kim fails to disclose, teach, or suggest “a plurality of optical network units each corresponding to only one of the plurality of optically pumped sources,” as recited in Claim 1, or similar features recited in Claim 16.

On page 11 of the Office Action, the Examiner appeared to rely on Stubkjaer merely to disclose “an optical wavelength converter in which a data signal λ_1 pumps the optically pumped source” and that “opto-electronic conversion is avoided.” Stubkjaer is directed to the use of semiconductor optical amplifiers for use as wavelength converters. (See Abstract). However, Stubkjaer fails to disclose, teach, or suggest “a plurality of optical network units each

corresponding to only one of the plurality of optically pumped sources,” as recited in Claim 1, or similar features recited in Claim 16.

On page 22 of the Office Action, the Examiner appeared to rely on Zah merely to disclose an “external cavity laser” and a “plurality of optical gain sources.” Zah is directed to a “multiwavelength laser [that] includes a phasor portion (2) for providing wavelength accuracy and a DBR portion ... for forming a laser cavity.” (Abstract). Zah teaches a “phasor multiplexer 320 located in the middle of a laser cavity 142.” (Column 4, lines 27-28). Zah further teaches that the phasor multiplexer provides “intercavity wavelength filtering.” (Column 4, lines 10-11). However, Zah fails to disclose, teach, or suggest “a plurality of optical network units each corresponding to only one of the plurality of optically pumped sources,” as recited in Claim 1, or similar features recited in Claim 16.

On page 25 of the Office Action, the Examiner relied on Keating to disclose that the kerb location is “passive.” Keating is directed to an “experimental setup and VCSEL structure” that “uses optical pumping to achieve lasing.” Keating discloses a 980 nm laser that optically pumps a VCSEL. However, Keating fails to disclose, teach, or suggest “a plurality of optical network units each corresponding to only one of the plurality of optically pumped sources,” as recited in Claim 1, or similar features recited in Claim 16.

Applicants further submit that any modification of Morales by the teachings of another reference to disclose “a plurality of optical network units each corresponding to only one of the plurality of optically pumped sources” would render Morales unworkable for its intended operation. Morales discloses a system wherein each ONT comprises several “planes of services” (e.g., ATM services, television services, ether services, etc.). Morales further discloses that these services are provided via different wavelength signals that are multiplexed and sent to an access node, wherein the signals are demultiplexed and sent to different OABs depending on the particular plane of service. As such, Morales requires that signals corresponding to each type of service be sent to an OAB that corresponds to that service. Therefore, each ONT of Morales must correspond to several different OABs in order to accommodate multiple planes of service.

Any modification of Morales so that each ONT only corresponds to one OAB would effectively negate the systems ability to divide the different planes of service amongst different OABs, and would eliminate the ability of the ONTs to accommodate multiple services. Such a modification would render Morales unworkable for its intended operation. As such, Applicants submit that any combination of the teachings of Kim, Stubkjaer, Zah, and/or Keating with Morales would not have been obvious to one of skill in the art.

- B. The applied references fail to disclose a plurality of optically pumped sources each receiving a signal having a different wavelength.

Amended independent Claim 53 recites, in part (with emphasis added):

receiving data modulated pumping light from a plurality of optical network units at a kerb location in an optical data transmission system, wherein the kerb location comprises a wavelength division multiplexer (WDM) and a plurality of optically pumped sources each assigned to a respective optical network unit, wherein a first optically pumped source is configured to receive the data modulated pumping light at a wavelength different from other wavelengths of data modulated pumping light received at the other optically pumped sources;

...

receiving the data modulated transmission light at the WDM from the plurality of optically pumped sources; and

routing, using the WDM, the data modulated transmission light for transmission to a hub based on the respective distinct wavelength channels

As discussed above with respect to Claim 45, Morales discloses that multiple signals having a same, fixed wavelength are received at the respective optical access boards (OABs). The fixed wavelengths of each signal are then converted to different wavelengths such that each signal passed through the OAB has a different wavelength. These signals (which have different wavelengths only after processing by the OAB) are then multiplexed and transmitted to the

switching center. However, Morales fails to disclose that the signals having different wavelengths are received at each respective OAB prior to processing by the OAB.

Applicants respectfully submit that Kim, Stubkjaer, Zah, and Keating, alone or in any proper combination with Morales, fail to cure the deficiencies of Morales.

As discussed above, Kim teaches a Fabry-Perot semiconductor laser diode that receives amplified spontaneous emission (ASE) from an ASE source and a pseudorandom bit sequence from a pattern generator. (See Abstract and Fig. 1). However, Kim discloses only that a single laser diode receives a signal from a single pattern generator. Stubkjaer is directed to the use of semiconductor optical amplifiers for use as wavelength converters. (See Abstract). Zah discloses a “phasor multiplexer 320 located in the middle of a laser cavity 142” and that the phasor multiplexer provides “intercavity wavelength filtering.” Keating discloses a single 980 nm laser that optically pumps a single VCSEL. However, nowhere do Kim, Stubkjaer, Zah, or Keating disclose signals having different wavelengths or optically pumped sources each receiving signals having different wavelengths. As such, Kim, Stubkjaer, Zah, and/or Keating, in any proper combination with Morales, fail to disclose, teach, or suggest “a plurality of optical network units each corresponding to only one of the plurality of optically pumped sources,” as recited in Claim 1, or similar features recited in Claim 16.

For at least the reasons discussed above, Applicants respectfully submit that Morales, Kim, Stubkjaer, Zah, and Keating, alone or in combination, fail to disclose, teach, or suggest each and every element of independent Claims 1, 16, 45, and 53 (and their associated dependent claims). As such, Applicants respectfully requests reconsideration and withdrawal of the rejection of Claims 1, 4, 8-13, 15, 16, 20, 21, 23, 33, 34, 47, 49, 50, and 52-59 under 35 U.S.C. § 103(a).

* * *

It is submitted that each outstanding objection and rejection to the Application has been overcome, and that the Application is in a condition for allowance. Applicants request consideration and allowance of all pending claims.


It should also be noted that although arguments have been presented with respect to certain claims herein, the recited subject matter as well as various other subject matter and/or combinations of subject matter may be patentable for other reasons. Further, the failure to address any statement by the Examiner herein should not be interpreted as acquiescence or agreement with such statement. Applicants expressly reserve the right to set forth additional and/or alternative reasons for patentability and/or allowance with the present Application or in any other future proceeding, and to rebut any statement presented by the Examiner in this or other papers during prosecution of the present Application.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by the credit card payment instructions in EFS-Web being incorrect or absent, resulting in a rejected or incorrect credit card transaction, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicants hereby petition for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

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